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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/757,508 | 01/15/2004 | Mohan Kirloskar | 50626.64 | 4619 |
| 35510 | 7590 | 06/16/2005 | EXAMINER | |
| KEATING & BENNETT, LLP 10400 EATON PLACE SUITE 312 FAIRFAX, VA 22030 | | | THAI, LUAN C | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2891 | |

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/757,508

Applicant(s)

KIRLOSKAR ET AL.

Examiner

Luan Thai

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 1-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>1/15/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election *without traverse* of Group I, claims 15-25, filed June 06, 2005 is acknowledged.

Information Disclosure Statement

2. The Information disclosure Statement filed on 01/15/04 has been considered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 15, 17, and 22-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Ooyama et al. (6,191,494).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 15, 17, and 22-25, Ooyama et al. (see specifically figures 4A-4B and 6) disclose a leadless plastic chip carrier comprising: a die attach pad (28); a semiconductor die (22) mounted on the die attach pad (28); a plurality of contact pads (26') circumscribing the die attach

pad; a ground ring (28') on a periphery of the die attach pad (28); a plurality of wire bonds (24) connecting the semiconductor die and various ones of the contact pads; and an overmold (23) covering the semiconductor die and the contact pads, wherein the die attach pad (28) is offset from the contact pads (28') such that the die attach pad (28) protrudes from the molding compound (23). Ooyama et al. further disclose the die attach pad (28) and the contact pads (26') comprising a plurality of layers of metal such as gold, nickel and palladium or others (see figure 6, Col. 7, lines 3-43).

5. Claims 15 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Awad et al. (6,894,382).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 15 and 17, Awad et al. (see specifically figures 4A-4B) disclose a leadless plastic chip carrier comprising: a die attach pad (212); a semiconductor die (218) mounted on the die attach pad; a plurality of contact pads (234) circumscribing the die attach pad; a ground ring (214) on a periphery of the die attach pad (212); a plurality of wire bonds (236-226) connecting the semiconductor die (218) and various ones of the contact pads (234); and an overmold (see figures 4A-4B) covering the semiconductor die and the contact pads, wherein the die attach pad (212) is offset from the contact pads (234) such that the die attach pad protrudes from the molding compound.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ooyama et al (6,191,494) in view of Lau et al. (6,667,073).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claim 18, Ooyama et al. disclose the claimed invention as detailed above except for a power ring.

Lau et al. while related to a similar leadless plastic chip carrier design teach (see specifically figure 2A) ground and power rings being formed intermediate the contact pads (203) and the die attach pad (202) in order to provide uniform ground and power supplies to the IC packages (Col. 1, lines 32+ and lines 18+). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Lau et al.'s teachings of a power ring with Ooyama et al.'s invention would have been beneficial because it helps to provide uniform power supplies to the IC packages.

8. Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooyama et al (6,191,494) in view of Lee et al. (6,661,083).

Regarding claims 19-20, Ooyama et al. disclose the claimed invention as detailed above except for a plurality of dice stacked on top of each other.

Lee et al. while related to a similar leadless plastic chip package design teach (see specifically figures 8-9-10 and 12) that the leadless plastic chip package could comprise one die, as disclosed in figures 8-9-10, or be modified to have a plurality of dice stacked on top of each other via a layer of epoxy, as disclosed in figure 12. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Ooyama et al.'s structure to have a plurality of dice stacked on top of each other, in order to have a stacked die package, as taught by Lee et al. and such modification is held to be within the ordinary designing ability expected of a person skilled in the art.

9. Claims 16 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooyama et al (6,191,494) and Lee et al. (6,661,083) as applied to 19 above, and further in view of Yoneda et al. (6,376,921).

Regarding claims 16 and 21, the proposed structure of Ooyma and Lee discloses the claimed invention as detailed above except for solder balls disposed on the contact pads. Note that Ooyma, in figure 6, does teach that solder material (37) is disposed on the contact pads (26').

Attaching solder balls on contact pads of a device package, however, is common in the semiconductor art for electrically connecting the package to a circuit board, as taught by Yoneda et al. (see specifically figures 14, 19, and 24). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form solder balls on contact pads of the proposed structure of Ooyma and Lee, since such solder balls are commonly applied in the art for electrically connecting the package structure to a circuit board, as taught by Yoneda et al.

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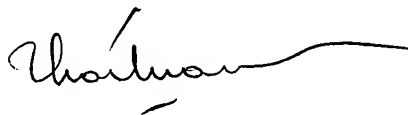
10. The following reference(s) is/are cited as of interest to this application:

U.S. Pat. No. 6,781,223 to Mihara et al. and Pat. No. 6,441,502 to Yamada et al.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is 571-272-1935. The examiner can normally be reached on 6:30 AM - 5:00 PM, Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley W. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Luan Thai

Primary Examiner

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June 12, 2005